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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,110	12/23/2003	Norikazu Arai	02860.0637-06	8016

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EXAMINER

CHU, KIM KWOK

ART UNIT	PAPER NUMBER
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2653

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/743,110	<b>Applicant(s)</b> ARAI ET AL.	
	<b>Examiner</b> Kim-Kwok CHU	<b>Art Unit</b> 2653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 7-10,13-15,19, 25,26, 50, 62, 65, 68, 76, 77, 84-87, 90-92,96,102,128 and 134-136 is/are rejected.
- 7) ☒ Claim(s) 113 and 114 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/23/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/487,928.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                                   |                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                              | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

Continuation of Disposition of Claims: Claims pending in the application are

1,7-10,13-15,19,25,26,50,62,65,68,76,77,84-87,90-92,96,102,113,114,128 and 134-136.

***Response to Remarks***

1. Applicant's Amendment filed on December 9, 2004 has been fully considered but it is not persuasive.

Applicant states that his claim 1 has This feature "the same-ordered diffractive rays, other than 0-th order rays, are used for reproducing or recording information from or onto the different recording mediums (page 3 of the Remarks, lines 15 and 16). Accordingly, Applicant did not claim "the same-ordered diffractive rays, other than 0-th order rays" in claim 1. In other words, Applicant does not claim that 100% of the n-th ordered light except zeroth ordered light is used to reproduce or record information. On the other hand, the prior art of Katayama uses n-th ordered light beams to reproduce or record information similar to Applicant's (Figs. 9 and 14; column 10, lines 39-45).

***Claim Objections***

2. Claims 1, 8, 9, 86 and 97 are objected to because of the following informalities:

(a) in claim 1, lines 21 and 24, the terms "great than" should be changed to --greater than--;

(b) in claim 8, line 4, the term "NA> NA2" should be changed to --NA1 > NA2--;

(c) in claim 9, the term "of claim 8," should be changed to --of claim 1,-- because the integer "n" is mentioned in claim 1;

(d) similarly, in claim 86, the term "of claim 85," should be changed to --of claim 77,-- because the integer "n" is mentioned in claim 77; and

(e) claim 97 should be cancelled because it is not in the submitted amended claims.

Appropriate correction is required.

**Claim Rejections - 35 USC § 102**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless -  
(b) the invention was patented or described in a  
printed publication in this or a foreign country or  
in public use or on sale in this country, more than  
one year prior to the date of application for patent  
in the United States.*

4. Claims 1, 7-10, 25, 26, 50, 62, 65, 68, 76, 77, 84-87, 102, 128, 134, 135 and 136 are rejected under 35 U.S.C. § 102(b) as being anticipated by Katayama (U.S. Patent 5,696,750).

Katayama teaches an optical reproduction apparatus for reproducing information from an optical recording medium having all the elements and means recited in claims 1, 7, 8, 10, 25, 26, 50, 62, 65, 68 and 76. For example, Katayama teaches the following:

(a) as in claim 1, a first light source 11 for emitting a first light flux having a first wavelength (635 nm) for reproducing or recording information from or onto a first optical information recording medium A having a first transparent substrate and a first information recording plane, the first transparent substrate having a first thickness (Fig. 8);

(b) as in claim 1, a second light source 12 for emitting a second light flux having a second wavelength (735 nm) for reproducing or recording information from or onto a second optical information recording medium B having a second transparent substrate and a second information recording plane, the second transparent substrate having a second thickness (Fig. 8);

(c) as in claim 1, the first wavelength being different from the second wavelength, and the first-thickness being different from the second thickness (Fig. 8; abstract);

(d) as in claim 1, a converging optical system 5" having an optical axis, a first diffractive portion 502, and a second diffractive portion 509 farther from the optical axis than the first diffractive portion 502 (Fig. 9);

(e) as in claim 1, a photodetector 1403 for receiving light flux reflected from the first information recording plane or the second information recording plane (Fig. 14);

(f) as in claim 1, the first light flux passes through the first diffractive portion 502 to generate at least one diffracted ray (Fig. 9; column 7, lines 65-67),

(g) as in claim 1, an amount of first n-th ordered diffracted ray of the first light flux is greater than that of any other ordered diffracted ray of the first light flux,

wherein  $n$  stands for an integer other than zero (Figs. 9 and 14; column 10, lines 39-45);

(h) as in claim 1, the second light flux passes through the first diffractive portion 502 to generate at least one diffracted ray (Figs. 9 and 14; column 8, lines 10-12);

(i) as in claim 1, an amount of second  $n$ -th ordered diffracted ray of the first light flux is greater than that of any other ordered diffracted ray of the second light flux, wherein  $n$  stands for an integer other than zero (Figs. 9 and 14; column 10, lines 39-45);

(j) as in claim 1, the converging optical system 5" converges the first  $n$ -th ordered diffracted ray of the first light flux which passes through the first diffractive portion 502 and a diffracted ray of the first light flux which passes through the second diffractive portion 509 on the first information recording plane of the first optical information recording medium A through the first transparent substrate so as to reproduce or record information from or onto the first optical information recording medium A (Figs. 8 and 9, first light flux passes through 509 and 502);

(k) as in claim 1, the converging optical system 5" converges the second  $n$ -th-ordered diffracted ray of the second light flux which passes through the first diffractive portion 502 on the second information recording plane of the second



optical information recording medium B through the second transparent substrate so as to reproduce or record information from or onto the second optical information recording medium B (Figs. 8 and 9);

(l) as in claim 7,  $\lambda_1 < \lambda_2$ , and  $t_1 < t_2$  ( $\lambda_1$  is 635nm,  $\lambda_2$  is 785nm,  $t_1$  is typically 0.6mm such as DVD,  $t_2$  is 1.2mm such as CD-ROM);

(m) as in claim 8,  $NA_1 > NA_2$  (column 9, lines 47-49,  $NA_1$  is 0.8 and  $NA_2$  is 0.45);

(n) as in claims 9 and 50,  $n$  is +1 or -1 (column 7, lines 65-66);

(o) as in claim 10,

(1)  $0.55 \text{ mm} < t_1 < 0.65 \text{ mm}$  (DVD);

(2)  $1.1 \text{ mm} < t_2 < 1.3 \text{ mm}$  (CD);

(3)  $630 \text{ nm} < \lambda_1 < 679 \text{ nm}$  (column 5, lines 49-51);

(4)  $760 \text{ nm} < \lambda_2 < 820 \text{ nm}$  (column 5, lines 49-51);

(5)  $0.55 < NA_1 < 0.68$  (column 5, lines 25 and 26);

(6)  $0.4 < NA_2 < 0.55$  (column 5 lines 31-33).

(p) as in claim 25, a difference in wavelength between the first light flux (635 nm) and the second light flux (785 nm) is 80 nm to 400 nm;

(q) as in claim 26, the first diffractive portion and the second diffractive portion comprise a plurality of annular

bands formed coaxially around the optical axis or centered around a point near the optical axis (Fig. 9);

(r) as in claim 50, wherein  $n$  is +1 or -1;

(s) as in claim 62, the first light flux of non-parallel light flux is allowed to go into the objective lens when the first light flux is used, and the second light flux of non-parallel light flux is allowed to go into the objective lens when the second light flux is used (Fig. 8);

(t) as in claims 65, the first light flux of parallel light flux is allowed to go into the objective lens when the first light flux is used, and the second light flux of non-parallel light flux is allowed to go into the objective lens when the second light flux is used; or the first light flux of non-parallel light flux is allowed to go into the objective lens when the first light flux is used, and the second light flux of parallel light flux is allowed to go into the objective lens when the second light flux is used (Fig. 8);

(u) as in claim 68, the first light flux of parallel light flux is allowed to go into the objective lens when the first light flux is used, and the second light flux of parallel light flux is allowed to go into the objective lens when the second light flux is used (Fig. 8); and

(v) as in claim 76, over shoot is 0% to 20% (Fig. 8; detection of signal has no ringing problem).

5. Claims 77, 84-87, 102, 128 and 134 have limitations similar to those treated in the above rejection, and are met by the references as discussed above.

6. Method claims 135 and 136 are drawn to the method of using the corresponding apparatus claimed in claim 1. Therefore method claims 135 and 136 correspond to apparatus claim 1 and are rejected for the same reasons of anticipation as used above. In addition, claim 136 teaches the following feature which is also disclosed by the prior art of Katayama:

(a) as in claim 136, detecting, by a photo detector, a first reflected light flux of the converged n-th ordered diffracted light from the first information recording plane or a second reflected light flux of the converged n-th ordered diffracted light from the second information recording plane (Fig. 5).

**Claim Rejections - 35 USC § 103**

7. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

8. Claims 13 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama et al (U.S. Patent 5,696,750) in view of Yoo et al. (U.S. Patent 6,363,046).

Katayama teaches an optical pickup very similar to that of the instant invention. However, Katayama does not teach the following:

(a) as in claims 13 and 90,  $\lambda_2$  is 780 nm.

Yoo teaches a DVD and CD-R recording system having  $\lambda_2 = 780$  nm (abstract).

A CD-R disk uses a laser source with a wavelength range about 780 nm as taught by Yoo. Even Katayama teaches that his CD-R disk uses a laser source with wavelength of 785 nm. For an alternate choice of a laser light source, it would have been obvious to one of ordinary skill in the art to replace Katayama's 785 nm laser source with Yoo's 780 nm laser source,

because both laser sources are within the wavelength range of a CD-R.

9. Claims 14, 15, 19, 91, 92 are 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama et al (U.S. Patent 5,696,750) in view of Saito et al. (U.S. Patent 6,192,021).

Katayama teaches an optical pickup very similar to that of the instant invention. However, Katayama does not teach the following:

(a) as in claims 14 and 91, the spherical aberration of the objective lens comprises a discontinuing section in at least one place;

(b) as in claims 15 and 92, the discontinuing section is at place near NA2; and

(c) as in claims 19 and 96, the spherical aberration of the objective lens is continued without having a discontinuing section.

Saito teaches an objective lens where its spherical aberration has both a continuous and a discontinuous section at a place near a numerical aperture (Figs. 4a to 4d).

When focusing an image with an objective lens, the spherical aberration is continuous as illustrated in Figs. 4a and 4b of Saito. However, when a diffractive portion of the

objective lens is used so that its numerical aperture is changed in order to focus a light beam on a surface of different thickness, it would have been obvious to one of ordinary skill in the art at the time of invention to use an objective lens with a discontinuous spherical aberration such as Saito's, because such objective lens reduces flare caused by the thickness difference of the focused surface.

***Allowable Subject Matter***

10. Claims 113 and 114 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

As in claim 113, the prior art of record fails to teach or fairly suggest an objective lens having the following features:

(a) the first diffractive portion and the second diffractive portion are provided on the substantially the entire light flux-incoming surface or substantially the entire light flux-outgoing surface of the objective lens.

As in claim 114, the prior art of record fails to teach or fairly suggest an objective lens having the following features:

(a) the first diffractive portion and the second diffractive portion are provided on a part of a light flux-incoming surface or a light flux-outgoing surface of the objective lens.

The features indicated above, in combination with the other elements of the claims, are not anticipated by, nor made obvious over, the prior art of record.

**Prior Art**

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shiono et al. (6,834,036) is pertinent because Shiono teaches that the second order diffracted light beams are used to read plural types of recording media.

**Final Action**

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action



14. Any response to this action should be mailed to:

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Or faxed to:

(571) 273-8300 (for formal communications intended for entry. Or:

(571) 273-7585, (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Any inquiry of a general nature or relating to the status of this application should be directed USPTO Contact Center (703) 308-4357; Electronic Business Center (703) 305-3028.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kim CHU whose telephone number is (571) 272-7585 between 9:30 am to 6:00 pm, Monday to Friday.

Kim-Kwok CHU

*Kim* 1/2/06  
Examiner AU2653  
January 2, 2006

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